

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Previously presented) A method, comprising:

 sending a PDISC Extended Link Service frame from a first device to a second device, wherein the first device is coupled to the second device via a fabric, and wherein the PDISC Extended Link Service frame is capable of determining a presence of the second device without disrupting I/O operations between the first device and the second device;

 receiving the PDISC Extended Link Service frame at the second device, and determining whether an initiator with the same port address but a different World Wide Port Name (WWPN) or World Wide Node Name (WWNN) than the first device is in a logged in state to the second device;

 logging out the first device, and responding to the PDISC Extended Link Service frame with a LOGO frame, in response to determining that an initiator with the same port address but a different WWPN or WWNN than the first device is in a logged in state to the second device;

 determining, at the second device, whether the first device is considered to be logged in to the second device, in response to determining that an initiator with the same port address but a different WWPN or WWNN than the first device is not in a logged in state to the second device;

 accepting, by the second device, the PDISC Extended Link Service Frame, and sending an LS_ACC frame indicating that the second device considers the first device to be logged in, wherein the LS_ACC frame includes the WWNN and WWPN of the second device, in response to determining that the first device is considered to be logged in to the second device;

 sending, by the second device, an LS_RJT frame or a LOGO frame that includes an indication that the second device does not consider the first device to be logged in to the second device; and

 determining, by the first device, whether to continue the I/O operations from the first device to the second device based on receiving a response to the PDISC Extended Link Service Frame within a time period.

2. (Previously presented) The method of claim 1, wherein the first device determines a possibility of an invalidation of the second device by-determining whether the first device has received either a notification of a state change from the fabric or has timed out while waiting for a completion of an I/O operation sent from the first device to the second device.

3-4. (Canceled)

5. (Previously presented) The method of claim 1, further comprising: continuing the I/O operations, if the response to the PDISC Extended Link Service frame within the time period is a frame that validates the World Wide Node Name and the World Wide Port name associated with a connection to the second device.

6. (Canceled)

7. (Previously presented) The method of claim 1, further comprising: terminating a connection from the first device to the second device, if the response to the PDISC Extended Link Service frame is not received within the time period or if the response is a frame that indicates that the second device does not consider the first device to be logged in to the second device.

8-11. (Canceled)

12. (Original) The method of claim 1, wherein the first and second devices are fibre channel adapters coupled to primary and secondary storage controllers respectively, wherein the fabric is a switched fabric, and wherein the fibre channel adapters communicate using extended link services commands.

13 – 36. (Canceled)

37. (Previously presented) The method of claim 1, wherein:

if the response is the LS_ACC frame, then:

- (i) the first device continues the I/O operations without interruption if the WWNN or WWPN in the LS_ACC frame validates an identity of the second device; and
- (ii) the first device terminates a logged in state of the first device to the second device, aborts all open tasks, and attempts to reestablish paths, if the WWNN or WWPN in the LS_ACC frame does not validate the identity of the second device.

38. (Previously presented) The method of claim 37, wherein:

if the response is a LS_RJT frame or a LOGO frame then the first device terminates the logged in state of the first device to the second device, aborts all open tasks, and attempts to reestablish paths.

39. (New) A system, comprising:

a first device;
a fabric, wherein the first device is coupled to the fabric;
a second device coupled to the fabric;
a memory; and
a processor coupled to the memory, wherein the processor performs operations, the operations comprising:

sending a PDISC Extended Link Service frame from the first device to the second device, and wherein the PDISC Extended Link Service frame is capable of determining a presence of the second device without disrupting I/O operations between the first device and the second device;

receiving the PDISC Extended Link Service frame at the second device, and determining whether an initiator with the same port address but a different World Wide Port Name (WWPN) or World Wide Node Name (WWNN) than the first device is in a logged in state to the second device;

logging out the first device, and responding to the PDISC Extended Link Service frame with a LOGO frame, in response to determining that an initiator with the same port address but a different WWPN or WWNN than the first device is in a logged in state to the second device;

determining, at the second device, whether the first device is considered to be logged in to the second device, in response to determining that an initiator with the same port address but a different WWPN or WWNN than the first device is not in a logged in state to the second device;

accepting, by the second device, the PDISC Extended Link Service Frame, and sending an LS_ACC frame indicating that the second device considers the first device to be logged in, wherein the LS_ACC frame includes the WWNN and WWPN of the second device, in response to determining that the first device is considered to be logged in to the second device;

sending, by the second device, an LS_RJT frame or a LOGO frame that includes an indication that the second device does not consider the first device to be logged in to the second device; and

determining, by the first device, whether to continue the I/O operations from the first device to the second device based on receiving a response to the PDISC Extended Link Service Frame within a time period.

40. (New) The system of claim 39, wherein the first device-determines a possibility of an invalidation of the second device by-determining whether the first device has received either a notification of a state change from the fabric or has timed out while waiting for a completion of an I/O operation sent from the first device to the second device.

41. (New) The system of claim 39, the operations further comprising:
continuing the I/O operations, if the response to the PDISC Extended Link Service frame within the time period is a frame that validates the World Wide Node Name and the World Wide Port name associated with a connection to the second device.

42. (New) The system of claim 39, the operations further comprising:
terminating a connection from the first device to the second device, if the response to the PDISC Extended Link Service frame is not received within the time period or if the response is a

frame that indicates that the second device does not consider the first device to be logged in to the second device.

43. (New) The system of claim 39, wherein the first and second devices are fibre channel adapters coupled to primary and secondary storage controllers respectively, wherein the fabric is a switched fabric, and wherein the fibre channel adapters communicate using extended link services commands.

44. (New) The system of claim 39, wherein:

if the response is the LS_ACC frame, then:

- (i) the first device continues the I/O operations without interruption if the WWNN or WWPN in the LS_ACC frame validates an identity of the second device; and
- (ii) the first device terminates a logged in state of the first device to the second device, aborts all open tasks, and attempts to reestablish paths, if the WWNN or WWPN in the LS_ACC frame does not validate the identity of the second device.

45. (New) The system of claim 44, wherein:

if the response is a LS_RJT frame or a LOGO frame then the first device terminates the logged in state of the first device to the second device, aborts all open tasks, and attempts to reestablish paths.

46. (New) A computer readable storage medium, wherein code stored in the computer readable storage medium when executed by a processor causes operations, the operations comprising:

sending a PDISC Extended Link Service frame from a first device to a second device, wherein the first device is coupled to the second device via a fabric, and wherein the PDISC Extended Link Service frame is capable of determining a presence of the second device without disrupting I/O operations between the first device and the second device;

receiving the PDISC Extended Link Service frame at the second device, and determining whether an initiator with the same port address but a different World Wide Port Name (WWPN)

or World Wide Node Name (WWNN) than the first device is in a logged in state to the second device;

logging out the first device, and responding to the PDISC Extended Link Service frame with a LOGO frame, in response to determining that an initiator with the same port address but a different WWPN or WWNN than the first device is in a logged in state to the second device;

determining, at the second device, whether the first device is considered to be logged in to the second device, in response to determining that an initiator with the same port address but a different WWPN or WWNN than the first device is not in a logged in state to the second device;

accepting, by the second device, the PDISC Extended Link Service Frame, and sending an LS_ACC frame indicating that the second device considers the first device to be logged in, wherein the LS_ACC frame includes the WWNN and WWPN of the second device, in response to determining that the first device is considered to be logged in to the second device;

sending, by the second device, an LS_RJT frame or a LOGO frame that includes an indication that the second device does not consider the first device to be logged in to the second device; and

determining, by the first device, whether to continue the I/O operations from the first device to the second device based on receiving a response to the PDISC Extended Link Service Frame within a time period.

47. (New) The computer readable storage medium of claim 46, wherein the first device determines a possibility of an invalidation of the second device by-determining whether the first device has received either a notification of a state change from the fabric or has timed out while waiting for a completion of an I/O operation sent from the first device to the second device.

48. (New) The computer readable storage medium of claim 46, the operations further comprising:

continuing the I/O operations, if the response to the PDISC Extended Link Service frame within the time period is a frame that validates the World Wide Node Name and the World Wide Port name associated with a connection to the second device.

49. (New) The computer readable storage medium of claim 46, further comprising: terminating a connection from the first device to the second device, if the response to the PDISC Extended Link Service frame is not received within the time period or if the response is a frame that indicates that the second device does not consider the first device to be logged in to the second device.

50. (New) The computer readable storage medium of claim 46, wherein the first and second devices are fibre channel adapters coupled to primary and secondary storage controllers respectively, wherein the fabric is a switched fabric, and wherein the fibre channel adapters communicate using extended link services commands.

51. (New) The computer readable storage medium of claim 46, wherein: if the response is the LS_ACC frame, then:

- (i) the first device continues the I/O operations without interruption if the WWNN or WWPN in the LS_ACC frame validates an identity of the second device; and
- (ii) the first device terminates a logged in state of the first device to the second device, aborts all open tasks, and attempts to reestablish paths, if the WWNN or WWPN in the LS_ACC frame does not validate the identity of the second device.

52. (New) The computer readable storage medium of claim 51, wherein: if the response is a LS_RJT frame or a LOGO frame then the first device terminates the logged in state of the first device to the second device, aborts all open tasks, and attempts to reestablish paths.